Space Launch Systems

October 19, 1988

A. C. Morrissey

MARTIN MARIETTA

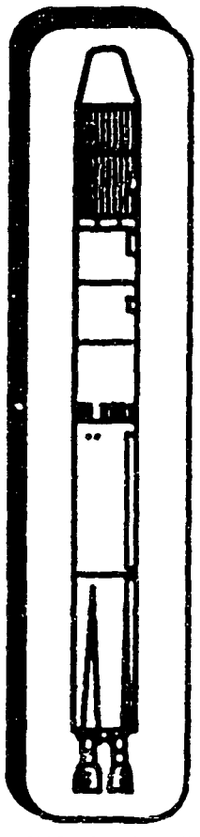
Operational Titan Launch Vehicles

Air Force launch vehicle for West Coast launches of small spacecraft.

Contract for refurbishment of fourteenTitan IIs through 1995.

Low earth polar orbit (100 nm x 100 nm) performance capability 4,200 lbs

Maximum payload envelope 9.3 ft dia x 30 ft long



TITAN II

Martin Marietta launch vehicle for East Coast launches of commercial and government spacecraft.

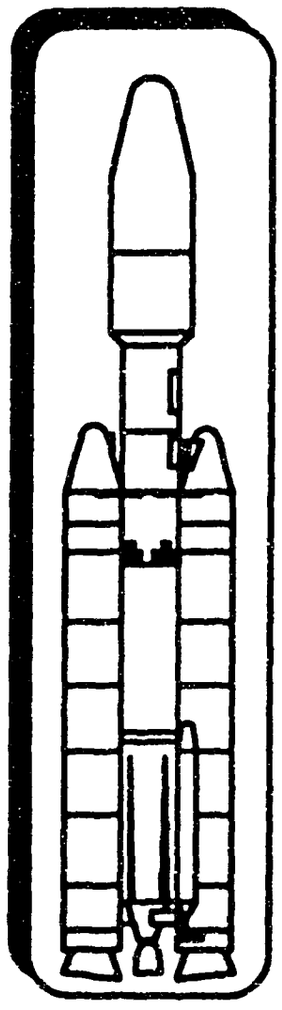
Three DOD Titan 34Ds in inventory. Final launch in 1989.

First commercial launch in 1989.

Geosynchronous transfer (Transtage, IUS, TOS) and low earth orbit missions (PAM-D, PAM-DII, SCOTS, integral)

Low earth orbit (80 nm x 140 nm) performance capability 31,600 lbs

Maximum payload envelope 12 ft dia x 47 ft long



TITAN III

Air Force launch vehicle for East and West Coast launches of large spacecraft.

Contract for 23 Titan IVs through 1993.

Centaur, IUS, and No Upper Stage missions

East Coast

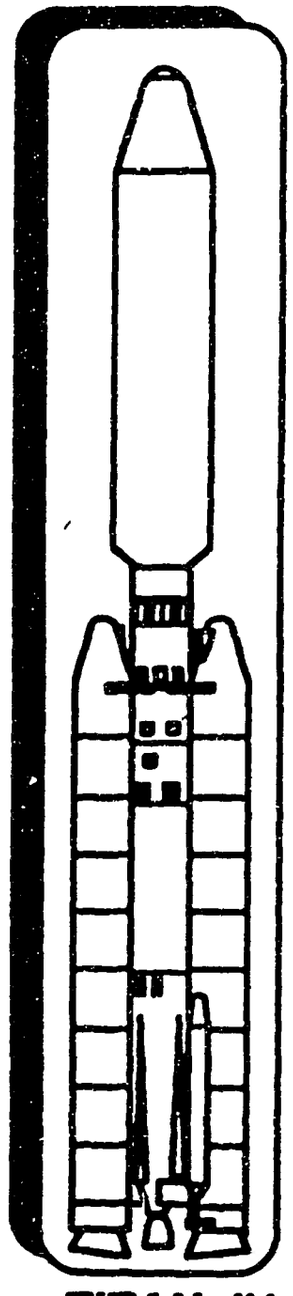
Geosynchronous orbit performance capability
10,000 lbs (with Centaur)
12,700 lbs (SRMU)

Low earth orbit (80 nm x 95 nm) performance capability
39,000 lbs
48,000 lbs (SRMU)

West Coast

Low earth polar orbit (100 nm x 100 nm) performance capability
32,000 lbs
40,000 lbs (SRMU)

Maximum 15 ft diameter payload envelope - 61.7 ft long



TITAN IV

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Titan IV

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Titan IV Overview

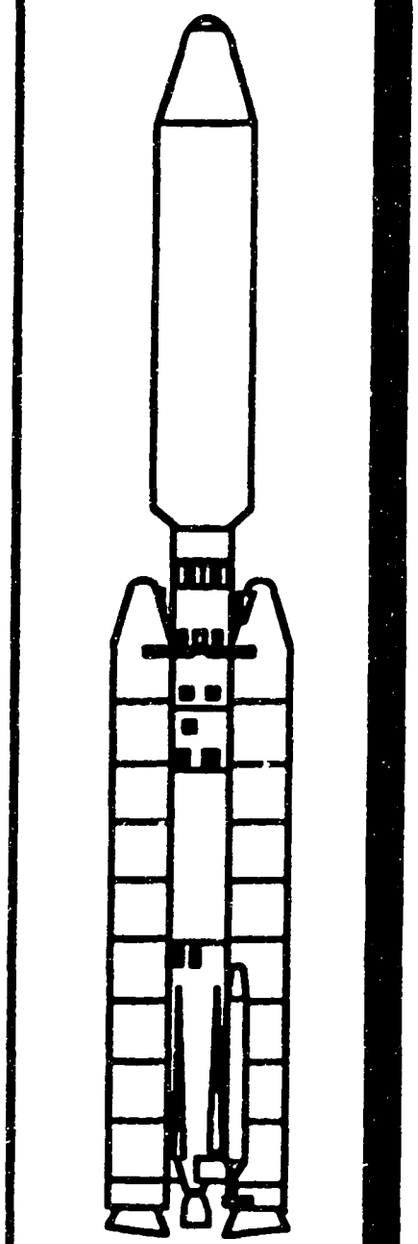
Customer : Air Force Space Division

Program : Build and launch twenty-three vehicles.
Initial Launch Capability:

- Inertial Upper Stage - 4th quarter 1988
- No Upper Stage (CCAFS) - 1st quarter 1989
- No Upper Stage (Vandenberg) - 1st quarter 1990
- Centaur - 2nd quarter 1990

Authority to Proceed : February 28, 1985

Prime Contractor :	Martin Marietta	• Airframe • Vehicle Integration • Payload Integration • Launch Operations
Principal Subcontractors :	General Dynamics	• Centaur Upper Stage
	McDonnell Douglas	• Payload Fairings
	United Technologies	• Solid Rocket Motors
	Hercules	• Solid Rocket Motor Upgrade
	Aerojet TechSystems	• Liquid Rocket Engines
	Delco Electronics	• Guidance
	SCI	• Instrumentation
	Cincinnati Electronics	• Command Receivers
	Analex	• Centaur Consultant
Associate Contractor :	Boeing	• Inertial Upper Stage



TITAN IV

Titan IV Program Summary

Program Status
- 23-vehicle program baseline; additional vehicle follow-on ATP early 1989
- Five configurations, two upper stages, and launch capability from both coasts

Core Vehicle
- First flight vehicle on the launch pad
- Second flight vehicle delivered to Cape Canaveral

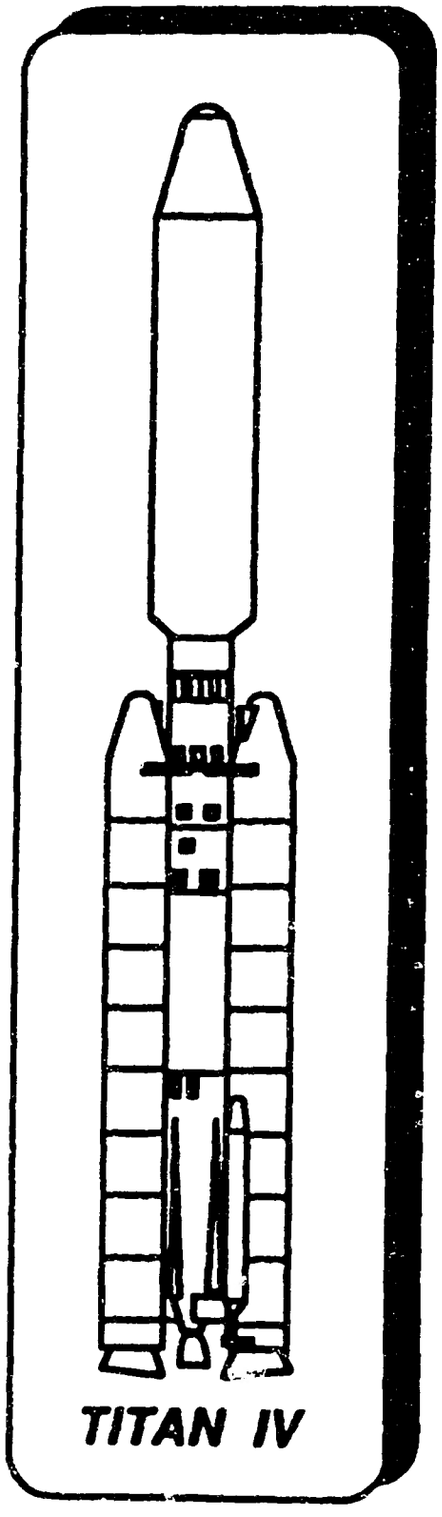
Liquid Rocket Engines
- First five systems complete
- Two systems shipped to Cape Canaveral

Solid Rocket Motors
- Reviews and testing complete
- First flight motors stacked and mated to core

Solid Rocket Motor Upgrade
- First full-scale case winding complete
- Preliminary Design Review scheduled October 1988

Payload Fairing
- Two units delivered to Cape Canaveral
- First flight unit in launch site processing

Centaur
- Tank design complete, test tank in major weld
- Qualification/design evaluation tests in progress



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